

4 Mitigation Strategy

The mission of the Macomb County Hazard Mitigation Plan is to protect the health and safety of the public and property of the community by taking action to permanently eliminate or reduce the long-term risk to human life and property from natural and human-caused hazards. In order to accomplish this mission, specific goals and objectives have been established. These goals and objectives are based on the County's hazard analysis, as well as input from the public, home and business owners, community organizations, and other interested entities.

Section 4.1 identifies the goals and objectives as determined by the Hazard Mitigation subcommittee. Each generalized goal has a number of specific objectives associated with it. Section 4.2 discusses the identification of alternative solutions and the filtering criteria used to screen projects. Section 4.3 and Appendix Z both present the list of hazard and flood mitigation projects identified for Macomb County. The list presented in Appendix Z is provided Microsoft Excel and intended to be a living document to be updated as these projects are implemented and new projects are identified.

Top 10 Hazards (Cumulative Ranking)			
HAZARD TYPE	RANK	NUMBER OF VOTES	AVERAGE RANK
Severe Winds	1	15	3.1
Snowstorms	2	14	3.4
Ice & Sleet Storms	3	13	4.3
Tornadoes	4	13	4.7
Transportation Hazmat Incident	5	13	5.7
Fixed Site Hazmat Incident	6	11	5.3
River Flooding	7	9	4.2
Lightning	8	9	4.6
Structural Fires	9	10	5.3
Infrastructure Failures	10	13	6.1

4.1 GOALS AND OBJECTIVES FOR 2005-2010

4.1.1 Goal 1: **Integrate hazard mitigation considerations into the community's comprehensive planning process.**

Encourage hazard provisions in local building codes.

- A. Encourage relocation of power lines below ground.
- C. Incorporate hazard mitigation into basic land use regulation mechanisms.
- D. Update of zoning ordinances to reflect new building code and shoreline protection rules.
- E. Develop code enforcement and zoning ordinances in urban/wildland intermix areas.
- F. Incorporate hazard area classifications into standard zoning classifications.
- G. Adopt urban forest management plans or ordinances.
- H. Develop community warning systems in areas of the county not presently covered.
- I. Strengthen anchoring requirements for propane tanks and hazardous material tanks in the floodplain/floodway.
- J. Strengthen the role of the Local Planning Committee in the land development process.
- K. Integrate hazard mitigation into the capital improvement planning process so that public infrastructure does not lead to development in hazard areas.
- L. Integrate hazard mitigation into the community's planning enabling legislation.

4.1.2 Goal 2: **Apply available resources to hazard mitigation.**

- A. Provide a list of desired community mitigation measures to the State of Michigan for possible future funding.
- B. Encourage the county Road Commission to review roads, bridges, and related transportation infrastructure for hazard vulnerability.
- C. Encourage private business involvement in hazard mitigation projects.

4.1.3 Goal 3: **Increase public awareness of hazard mitigation.**

- A. Increase awareness of hazard provisions in local building codes.
- B. Increase awareness of the National Flood Insurance Program.

4.1.4 Goal 4: **Complete all hazard mitigation projects as scheduled.**

- A. Track projects at County level to maximize support and efforts to implement.
- B. Update HMP projects annually.

- C. Show current project listing as an appendix to simplify review and update of the HMP

4.1.5 Goal 5: Increase local participation in hazard mitigation.

- A. Encourage cooperation and communication between urban planning and emergency management officials in local county communities.
- B. Encourage local agencies, such as the fire, police, planning, and building departments, to participate in the hazard mitigation process.
- C. Encourage public and private organization participation.
- D. Encourage communication between emergency managers and the Local Emergency Planning Committee.

4.2 IDENTIFICATION OF ALTERNATIVES FOR SOLVING PROBLEMS

Macomb County used a variety of sources in developing a range of potential solutions for solving identified problems associated with the various hazards addressed in this plan.

First, a series of brainstorming sessions were held to solicit ideas and suggestions from local public officials, citizens, home and business owners, community organizations, the county planning department, the state and federal government. At these meetings, suggestions were made on possible ways to reduce or eliminate community vulnerability to natural and technological hazards. Those suggestions were grouped by hazard type. Then, a screening committee comprised of local emergency managers from the cities of Warren, Sterling Heights, Fraser, and the Township of Clinton went through the ideas and suggestions and filtered out those that were not compatible with the county's goals and objectives or were not technically or financially feasible. Through this screening process, only those alternatives that had a viable chance of being implemented were actually considered.

4.2.1 Filtering Criteria Used to Select and Prioritize Alternatives

Next, a set of filtering criteria was developed in order to determine which of the mitigation alternatives were best suited to address the identified problems within the current framework of mitigation programs and policies within the county. The following filtering criteria were used to select and prioritize alternatives for this plan:

Filtering Criteria

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- The cost of the measure must be less than the cost of repetitive repairs that would be necessary if the measure were not implemented.
 - The measure must be acceptable to those participating and/or primarily impacted.
 - The measure must be affordable to all it affects, and not discriminate against those who are unable to bear the cost.
 - The measure must not result in an inequitable distribution of essential public services.
 - The measure must be environmentally sound and not cause any

permanent, significant environmental concerns.

- The measure must technically be feasible.

County decision-makers then reviewed the list of alternatives against the established filtering criteria to come up with the list of the most desired alternatives for each county goal.

4.3 MACOMB COUNTY COMPREHENSIVE MITIGATION PROJECTS

After analyzing the range of hazards which affect the County, and developing a "Top Ten" list based on severity, generalized County actions and projects pertaining to these hazards were determined using the filtering criteria method mentioned in the previous section. Section 4.4 of this chapter will identify specific mitigation actions and projects for each community within Macomb County. The actions are listed under each hazard that they pertain to. The hazards are listed in order of priority as determined by the Hazard Assessment in chapter two. Each recommended action is addressed similarly and includes the following analysis components:

- Title
- Description of the action
- Lead manager assigned
- Schedule to initiate action
- Potential sources of technical assistance
- Potential sources of financial assistance

4.3.1 Severe Weather (Severe Winds, Snow/Ice/Sleet Storms, Tornadoes, Lightning)

Reduce disaster-related damage to electric power facilities and systems.

Severe weather in Macomb County continues to result in damage to the county's electrical infrastructure each year.

HMP 04-003

Priority 1

Life Safety

Title: Construct Mobile Home Park Saferooms

Description of the action: Construction of 'safe rooms' in mobile home and manufactured home parks. An investigation of which mobile home parks have historically suffered the most losses from tornadoes and high winds must first be performed. Funding can be used to purchase or construct and install the 'safe rooms' in existing and future home sites. In some cases, anchoring the home may be a more feasible option.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270

Schedule to Initiate Action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: Michigan State Police Emergency Management Division.

Potential Sources of Financial Assistance: State Hazard Mitigation Program.

HMP 04-002

Priority 3

Life Safety

Title: Conduct Power Distribution Study

Description of the action: Conduct a study of the electrical distribution system across Macomb County to identify who owns the power lines, which power lines are most critical in terms of customers served, and which power lines experience the most outages and impact the most customers. Identify recommendations and establish priorities for relocating critical power lines underground.

The study will attempt to identify the most problematic areas within Macomb County, the key stakeholders and participants in the effort, costs associated with current maintenance and cost to bury the lines, and other pertinent information.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270

Schedule to Initiate Action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: Michigan State Police Emergency Management Division.

Potential Sources of Financial Assistance: State Hazard Mitigation Program.

HMP 04-001

Priority 5

Infrastructure

Title: Trim trees county-wide

Description of the action: This project focuses on trimming trees to prevent encroachment of overhead lines. The project manager will conduct a survey and identify trees that if damaged by severe weather may cause infrastructure failure. This project has been estimated to cost \$20,000.00.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270

Schedule to Initiate Action: Initiate grant applications by May 1 of each year, and resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: Michigan State Police Emergency Management Division.

Potential Sources of Financial Assistance: State Hazard Mitigation Program.

4.3.2 Flooding

Reduce flood losses to the fullest extent possible.

The floodway is the most dangerous and destructive portion of the floodplain. The floodway is intended to carry the entire 100-year flood without increasing the flood height by more than 1/10 of a foot. The floodway has the most stringent development and building regulations within the floodplain. This is a potentially harmful location for a building, because state and local codes make it difficult to repair, expand, or replace existing structures. All efforts should be made to clear the floodway of obstructions and maintain the floodplain in an "open state." This will also clear the property adjacent to the river so that it can be reused as a contiguous riverfront recreation area.

Establish a voluntary acquisition program of floodway properties based on Fair Market Value. Retain in public ownership and rezone as a conservation area. Implementation will be managed by a team consisting of the Macomb County Emergency Management Coordinator and local community officials and will report to the local governments.

FMP 01-003

Priority 4

Structural

Title: Flood Mitigation of 25 Homes in 100-year flood plain

Description of the Action: The analysis, conducted by the Michigan Department of Environmental Quality, notes about 20 to 25 houses that may be currently within the 100-year floodplain. The Flood Mitigation Assistance Program and the Hazard Mitigation Grant Program both may be used to purchase, relocate, or flood-proof homes that are prone to flooding.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270 with support from local township supervisors.

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

FMP 01-007

Priority 2

Infrastructure

Title: Upgrade pump stations

Description of the Action: The townships of, Harrison, Chesterfield, and the City of Fraser have identified problems with their pump stations. During periods of heavy rains, sanitary sewage is allowed to enter the storm sewers. These storm sewers enter into the Clinton Drain and then into Lake St. Clair which relates to health and safety issues at hand. If this sewage is not permitted to go to the storm sewer, the basements of the residents in the area will flood. The estimated cost to upgrade these facilities has been estimated to be \$100,000.00.

Lead Manager(s) Assigned: Water Department Supervisors for Harrison and Chesterfield Township and the City of Fraser would take lead for their respective communities.

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

4.3.3 Structural Fires

Reduce occurrences of fire incidents; reduce loss of life and property from fires; continue to educate on fire safety.

Structural fires continue to be the biggest hazard facing most communities in Macomb County and according to the National Fire Protection Association, cause more loss of life and property damage than all types of natural hazards combined.

This is a historically long standing problem and a lot of effort has already gone into its resolution. All of the building, fire, and life safety codes in use focus on building materials, emergency lighting, and emergency egress. Municipalities all have building and fire inspectors who enforce construction and operational facility compliance with building, fire, and life safety codes.

HMP 04-005

Priority 6

Life Safety

Title: Upgrade MCC Fire Science Curriculum

Description of the Action: Identify additional courses that can be added to Macomb Community College fire science curriculum. Identify additional training for fire, building, planning, and zoning officials. Analyze causes of fires across Macomb County to determine opportunities for reduction. Continue monthly meetings of Macomb County Fire Inspector's Association.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270 and the Fire Chiefs for their respective communities.

Schedule to Initiate Action: Initiate grant applications by May 1 of each year, and resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: Michigan State Police Emergency Management Division, National Fire Protection Association.

Potential Sources of Financial Assistance: Hazard Mitigation Grant Program, State Hazard Mitigation Program.

4.3.4 Infrastructure Failures

Reduce occurrences of power outages; maintain communication capability during power losses

The four hazards that were ranked highest by the communities across Macomb County were severe winds, snowstorms, ice & sleet storms, and tornadoes. Each of these has the ability to create a range of dangerous situations that can result in loss of life, injuries, and property damage. But one of the recurring problems that has the greatest impact on affected communities is loss of power due to overhead lines. Not only do they result in the lost productivity associated with closed businesses and schools and disruption of communication systems, but downed power lines also can be a deadly hazard that places huge demands on the manpower of first responder organizations and the utility companies.

Underground power lines are more reliable with much less disruption due to incidents involving severe winds, snowstorms, ice & sleet storms, and tornadoes. Consequently, this report targets relocation of power lines from above ground to underground. The project below,

HMP-4-002, was also listed under Severe Winds. Although only listed there and here, it clearly provides mitigation to all four of the top hazards listed.

HMP 04-002

Priority 3

Life Safety

Title: Conduct Power Distribution Study

Description of the action: Conduct a study of the electrical distribution system across Macomb County to identify who owns the power lines, which power lines are most critical in terms of customers served, and which power lines experience the most outages and impact the most customers. Identify recommendations and establish priorities for relocating critical power lines underground.

The study will attempt to identify the most problematic areas within Macomb County, the key stakeholders and participants in the effort, costs associated with current maintenance and cost to bury the lines, and other pertinent information.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270

Schedule to Initiate Action: Initiate grant applications by May 1 of each year, and resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: Michigan State Police Emergency Management Division.

Potential Sources of Financial Assistance: Hazard Mitigation Grant Program, State Hazard Mitigation Program.

4.4 INDIVIDUAL COMMUNITY MITIGATION PROJECTS

As discussed in Section 4.3 of this chapter, this section identifies specific mitigation actions and projects for individual communities within Macomb County. Many communities within the County experience repetitive flood damages. This section will list the communities in alphabetical order. However, the 'Structural Vulnerability Flood Projects' and 'Road Vulnerability Flood Projects' will be listed in order of priority as explained in the next paragraph. Where communities have not identified current projects or actions for their jurisdiction, they may find that the Comprehensive Mitigation Actions for Macomb County section will suffice at a later date.

As described in a previous section, identified hazard areas have been broadly classified into four different levels of priority. It is necessary to further assess the risks and hazards facing some areas that have been assessed as "second priority," along with some of those that were categorized as "third priority." This section contains an assessment that also suggests the priority that should be given to specific mitigation projects that the hazard analysis has identified as being top priority or second priority. Not all of the listed projects will be appropriate for funding from the Flood Mitigation Assistance Program, but are included anyway because they are important to alleviate current or potential flood problems in the county. **THE 'STRUCTURAL AND ROAD VULNERABILITY FLOOD PROJECTS' BELOW HAVE BEEN ASSIGNED A PRIORITY BASED ON THE NUMBER OF STRUCTURES AND MAJOR ROADS AT RISK, AND THE FLOOD DEPTH AND RISK LEVELS AFFECTING THOSE STRUCTURES AND ROADS.** Some of the projects may be easier to implement than others, and so the priorities may not be the only determinant of the order in which the projects will be accomplished. Rather, actual project implementation will depend on gaining the approval of stakeholders, identifying specific factors to implement mitigation actions, and demonstrating that the costs of mitigation actions will be less than the benefits that result for the community or communities involved.

4.4.1 Village of Armada

FMP 01-008

Priority 1

Structural

Title: Floodproof home

Description of the action: A low-sitting house in the village of Armada is proposed for mitigation activities because ponding water in its yard goes right up to the back of the house during rainy weather conditions. The village is an NFIP-participating community and the house is located just outside the 100-year floodplain (Zone AE) on the area's Flood Insurance Rate Map. Possible mitigation strategies include creation of a nearby retention pond or berm to keep waters from collecting in the homeowner's yard. Floodproofing of the home would be helpful.

Lead manager assigned: Nancy Parmenter, President, Village of Armada, 586-784-9151

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program. Local sources, foundations, nonprofit organizations, and/or the involved homeowner might also be useful to assist with project funding.

4.4.2 Armada Township

HMP 05-002

Priority 1

Infrastructure

Title: Emergency Siren System

Description of the action: Armada Township is still very undeveloped but is predicted to have significant development increases in the upcoming years. Installing an emergency siren system early on will ensure all areas of the community are covered before residential and commercial development begins playing a major role in land disputes for placement of these sirens.

Lead manager assigned: Don Eison, Supervisor, Armada Township, 586-784-5200

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 05-003

Priority 2

Infrastructure

Title: Trailer Park Shelter

Description of the action: Mobile and manufactured home construction often times lends it to be extremely vulnerable during high wind events and tornadoes. The township wishes to install 'safe rooms' in the mobile home parks to provide shelter during these events.

Lead manager assigned: Don Eison, Supervisor, Armada Township, 586-784-5200

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.3 Bruce Township

FMP 01-009

Priority 1

Structural

Title: Mitigate basement flooding on 34 Mile Road

Description of the action: Two houses on 34 Mile Road near the Mahaffy Drain in Bruce Township have experienced basement flooding as a result of area land developments and increased water runoff. The houses have installed sump pumps to alleviate this problem. Although minor damages have occurred, these houses are not located in an officially mapped floodplain area. Possible mitigation strategies include drain cleaning or improvement to expand its capacity, or other structural projects to slow or divert the flow of runoff waters.

Lead manager assigned: Gary Schocke, Supervisor, Bruce Township, 586-752-4585

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County

Potential sources of financial assistance: Michigan Department of Agriculture Intercounty Drain Program or existing county drain maintenance funds. Local funding sources, foundations, nonprofit organizations, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-010

Priority 2

Infrastructure

Title: Mitigate flooding of roads within Bruce Township

Description of the action: Bruce Township road flooding over M-53. The traffic count along that area is roughly 18,500 vehicles per day, but it is assumed at this point in the analysis that the flooding merely causes traffic delays rather than requiring detours.

Lead manager assigned: Gary Schocke, Supervisor, Bruce Township, 586-752-4585

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County

Potential sources of financial assistance: Michigan Department of Agriculture Intercounty Drain Program or existing county drain maintenance funds. Local funding sources, foundations, nonprofit organizations, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

4.4.4 City of Centerline

HMP 05-004

Priority 1

Life Safety

Title: Establish Ordinance to locate all Future Power Lines Underground

Description of the Action: Power outages are a recurring theme associated with damage to aboveground power lines during severe winds, thunderstorms, snow and ice storms, and other severe weather incidents. This action is to have the municipal government pass an ordinance to require all new installations of power lines and electrical services to be placed below ground.

Lead manager assigned: Mary Ann Zielinski, Mayor, Center Line, 586-757-6800

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

HMP 05-005

Priority 2

Infrastructure

Title: Trim trees that encroach on power lines

Description of the action: The scope of this project is to identify and trim those trees that are beginning to encroach into the safety zone of overhead lines throughout the municipality. The project manager will conduct a survey and identify trees that if damaged by severe weather may cause infrastructure failure. This project has been estimated to cost \$8K.

Lead manager assigned: Mary Ann Zielinski, Mayor, Center Line, 586-757-6800

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

4.4.5 Chesterfield Township

FMP 01-051

Priority 1

Structural

Title: Mitigate flooding at Canal south of Field Street in Section 32

Description of the action: In Section 32 of Chesterfield Township, there is a canal south of Field Street which has about 9 nine homes and 3 commercial buildings near it that have been heavily affected by flooding during periods of high water levels along Lake St. Clair. In 1985 and 1986, flood waters reached depths of 6 to 12 inches around the homes. The commercial buildings are located where the canal meets the Lake Waters. They are a party store, a marina office, and a gas dock, and they suffered floodwaters that were up to 18 inches deep. Much of the area is identified as a 100-year floodplain (Zone A3). Although some of the houses were classified with a lesser floodplain designation (Zone B), the key on the FIRM document was rather unclear about what the designation really meant for the area. I believe the Zone B classification here refers to an area subject to 100-year flood events of less than one-foot water depths. The community is a participating NFIP member.

Possible mitigation strategies for this area of shoreline flooding include some sort of flood wall project that might be most cost-beneficial to protect against storm surges. Canal redesign ideas might also be explored. Some houses could be elevated. A new pump station project should greatly help alleviate flooding to the at-risk properties along Jefferson Avenue.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Home elevations could be handled by the Flood Mitigation Assistance Program or Hazard Mitigation Grant Program. Flood wall and engineering options might be explored by the U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners or businesses (also business associations or economic development funds) might also be used to assist with project funding.

FMP 01-011

Priority 2

Structural

Title: Mitigate flooding of 11 residences in Section 32

Description of the action: Just northeast of Project FMP 01-051, in section 32 of Chesterfield Township, is a 100-year floodplain area (Zone A3) along a canal, with about 11 houses (including one of the NFIP's identified repetitive-loss properties) that experienced flooding of 6 to 12 inches in the 1970s. Pumps and sandbagging were needed during the 1980s to reduce damages. The community is a participating NFIP member.

Possible mitigation strategies include acquisition of the repetitive loss property; elevation of flood-prone structures; and re-engineering the canal to prevent flooding. A new pump station project should greatly help alleviate flooding to the at-risk properties along Jefferson Avenue.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, re-engineering options possibly researchable by the U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be used to provide needed funding.

FMP 01-012

Priority 3

Structural

Title: Mitigate flooding for 106 residences along shoreline of Section 32

Description of the action: In the vicinity of the shoreline of Section 32 of Chesterfield Township, the meaning of the Zone B flood designation has been interpreted as indicative of areas that suffer 100-year flooding of less than one foot of water depths. There are about 106 houses located east of Jefferson and south of Farwell that are in this significant risk category, with 2 to 4 inches of floodwaters in the houses in the 1970s, and sandbagging efforts required since then to reduce damages. The community is a participating NFIP member.

Possible mitigation strategies include acquiring or elevating the repetitive-loss property. Some engineered solution might be found for canal redesign to prevent overflow waters from flooding the roads and houses nearby.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, re-engineering options possibly researchable by the U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

FMP 01-013

Priority 4

Structural

Title: Mitigate flooding of 13 residences southwest of Cotton Road in Section 28

Description of the action: In Section 28 of Chesterfield Township, southwest of Cotton Road, is a shoreline area with about 13 homes that has experienced flooding from Lake St. Clair. These houses are in an identified 100-year floodplain area (Zone A3) and flood depths have been as much as 6 to 8 inches in these homes. During the current period of low lake levels, mitigation actions should be taken to prevent further flooding when lake levels rise again. The community is a participating NFIP member.

Possible mitigation strategies include replacing an existing dirt berm and emergency sandbagging efforts with a more permanent flood wall structure to protect houses from shoreline flooding during periods of high lake levels and storm surges. The repetitive-loss property could be acquired or elevated. Canals would probably also need some engineered solution to discourage overflow waters from flooding the roads and houses nearby.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, re-engineering options possibly researchable by the U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

FMP 01-014

Priority 5

Structural

Title: Mitigate flooding in 36 residences along Sugarbush Road in Section 27

Description of the action: This project concerns houses in Section 27 of Chesterfield Township, along Sugarbush Road, south of the high school. Although the area has been classified as between a 100 and 500-year floodplain (Zone B), there are 36 houses that have been assessed as higher-risk by local officials. Water floods around these houses to a depth of 8 to 12 inches, and residents have been observed using sandbags to prevent water damages to the structures. The community is a participating NFIP member.

Possible mitigation strategies include structural flood protection measures to replace sandbagging efforts; improved road drainage and use of retention basins; continued monitoring for worsening risk since some surface water retention may have been intended by the area's developmental design.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Existing county road or drain maintenance/improvement funds. Local funding sources, foundations, nonprofit organizations, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-015

Priority 6

Structural

Title: Mitigate flooding of structures west of Jefferson and north of Anchor Road in Section 32

Description of the action: In Section 32 of Chesterfield Township there is an area west of Jefferson and north of Anchor Road that has found it necessary to use sandbags to try to protect the structures there, which are all in a 100-year floodplain area (Zone A3). The structures are a party store, laundromat, and 17 homes. The community is a participating NFIP member.

Possible mitigation strategies include elevation of flood-prone structures; re-engineering the canal to prevent flooding. A new pump station project should greatly help alleviate flooding to the at-risk properties along Jefferson Avenue.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners or businesses (also business associations or economic development funds) might also be useful to assist with project funding.

FMP 01-016

Priority 7

Structural

Title: Mitigate flooding at 4 apartment buildings in Section 22.

Description of the action: In Section 22 of Chesterfield Township, there are four apartment buildings that have nearby drainage back-ups that cause waters to come right up to the buildings. The buildings are in an area designated as between a 100 and 500-year floodplain (Zone B) on the community's FIRM, and many seniors live in the area. The community is an NFIP participant. Some local money is being generated and should be available to provide matching funds for grants or drain-cleaning activities.

Possible mitigation strategies include construction of a retention pond, berm or wall to keep floodwaters out of the at-risk buildings.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Local road or drainage authorities, other local funding sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-017

Priority 8

Structural

Title: Mitigate flooding of 17 homes along Auvase Creek in Section 28

Description of the action: In Section 28 of Chesterfield Township, there are about 17 homes along Wand Street and the Auvase Creek that are located in a 100-year floodplain (Zone A3). Local officials agree that the actual flood risks are significant, and that floodwaters have had moisture effects on elements of the homes and their furnishings, so actions are recommended to mitigate against future flood damages. The community is a participating NFIP member.

Possible mitigation strategies include elevation of structures. Creation of berms or floodwalls may also help prevent flooding.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program, U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-018

Priority 9

Structural

Title: Mitigate Flooding for 2 houses near Salt River in Section 23

Description of the action: In Section 23 of Chesterfield Township there are two houses that are in a designated 100-year floodplain (Zone A3). Local officials consider these houses to be at higher risk of flooding. They are near the Salt River, south of Callens Road and west of Hooker Road, and the community is a participating NFIP member.

Possible mitigation strategies include elevation of structures. Creation of berms or floodwalls may also help prevent flooding.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program, U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-019

Priority 10

Structural

Title: Mitigate flooding of business in Section 15

Description of the action: In Section 15 of Chesterfield Township, there is a business located in an NFIP-identified 100-year floodplain (Zone A2), but whose flood risks are now reported by local officials to exceed those of that classification. The community is an NFIP participant.

Possible mitigation strategies include elevation, relocation, or acquisition of the structure. Creation of berms or floodwalls may also help prevent flooding.

Lead manager assigned: Jim Ellis, Supervisor, Chesterfield Township, 586-949-0400

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.6 Clinton Township

FMP 01-002

Priority 1

Structural

Title: Flood Mitigation of home within Moravian Manor

Description of the Action: Public acquisition and management of lands that are vulnerable to damage from flooding hazards. Properties that have been identified in the Moravian Manor subdivision are located within the 100-year floodplain (Zone AE). The Base Flood Elevation Line is 593 feet. A residential unit, which is exposed to a severe flooding hazard, has been identified, and the owner has agreed to sale at fair market value. The total amount of acreage is 2.752 acres, with an estimated appraised value of \$102,000.00. Estimated incidental costs (appraisal fees) total \$8,000.00. The total acquisition costs for the vacant lots and one residential unit is estimated at \$110,000.00.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

FMP 01-001

Priority 2

Structural

Title: Flood Mitigation of property adjacent to Frank H. Budd Park

Description of the Action: Adjacent properties to Frank H. Budd Park in Clinton Township have been targeted for acquisition to complete an assembly of properties. Properties have been acquired utilizing the Township General Fund, Community Development Block Grant (CDBG) Program and the Michigan Natural Resources Trust Fund Grants.

These proposed acquisitions include four small lots located in Riverside Gardens Subdivision. Initially, the CDBG Program was utilized to relocate families because of severe flooding. These lots are vacant and within the 100-year floodway of the Clinton River. This acquisition would accomplish acquisition of the entire subdivision by Clinton Township and vacating of an unnecessary public road (Kerner Street). In addition, it would complete the expansion of Frank H. Budd Park that would include contiguous properties without non-township owned land surrounded by the park. The estimated appraised value is \$76,000.00 with incidental costs of \$24,000.00. The incidental costs include the possible removal of old house foundations, debris, and septic tanks. This property would be used only for public recreation.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

FMP 01-021

Priority 3

Infrastructure

Title: Mitigate road flooding of Clinton River Road

Description of the action: Clinton Township area of road flooding on Clinton River Road. This road actually becomes unsafe to use during flood events.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-051

Priority 4

Infrastructure

Title: Mitigate road flooding of Groesbeck Road south of 16 Mile Road

Description of the action: Clinton Township area of road flooding at Groesbeck south of 16 Mile Road, with traffic averaging 36,000 vehicles per day. This flooding causes some delays but doesn't close the road completely.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-052

Priority 5

Infrastructure

Title: Mitigate road flooding of Kelly Road between 15 and 16 Mile Roads

Description of the action: Clinton Township area of frequent road flooding at Kelly Road between 15 and 16 Mile Roads. Delays frequently result from this flooding.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to initiate action: Apply for 2005 Grant and implement upon receipt of funding

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-020

Priority 6

Structural

Title: Mitigate flooding of Residence in Section 15

Description of the action: There is a house in Section 15 of Clinton Township that was on the NFIP's list of repetitive-loss structures. Although the home does not appear on current lists of repetitive-loss structures, it has been approved for an acquisition project, upon approval and adoption of this mitigation plan. It was calculated that this acquisition would prevent more than \$5000 of flood damages per year. The structure is located in an area designated a Zone AE floodway, and the community is a participating NFIP member.

Suggested mitigation strategy is acquisition of property for removal from floodplain, converting the area to open space uses.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to initiate action: Apply for 2005 Grant and implement upon receipt of funding

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local funding sources, parks & recreation funds, foundations, nonprofit organizations, and/or corporate giving programs, might provide additional funds necessary for the proposed solution.

FMP 01-006

Priority 7

Infrastructure

Title: Develop Disaster Mitigation/Emergency Response GIS

Description of the Action: Clinton Township is developing a Geographic Information System (GIS) for disaster mitigation and emergency response planning. Clinton Township plans to use the system for identifying flood plain areas prone to natural flooding, surface water modeling for flood control and storm water management and identifying the spatial relationships between residential, special populations, potential hazards, and emergency services. The cost for this system has been estimated at \$20,000.00.

Lead Manager(s) Assigned: Paul Brouwer, Emergency Coordinator, Clinton Township, 586-723-8069

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

4.4.7 City of Eastpointe

HMP 04-006

Priority 1

Infrastructure

Title: Back-up Generator Project

Description of the action: Install back-up generators throughout City of Eastpointe in support of essential functions. The City of Eastpointe has many key facilities located within its borders. Since it is an older community, the potential for power outages is much greater. The installation of backup generators will allow the city to perform its essential functions during loss of power events.

Lead Manager(s) Assigned: Dan Hagan, Fire Chief, Eastpointe, 586-445-5057

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 04-007

Priority 2

Infrastructure

Title: Reverse 9-1-1 System

Description of the action: Establish a Reverse 9-1-1 system for City of Eastpointe. This system will give the city the ability to call residents and businesses with emergency information before or during an event or incident. This system could be extremely helpful for predicted weather events to alert people before the storm reaches the community.

Lead Manager(s) Assigned: Dan Hagan, Fire Chief, Eastpointe, 586-445-5057

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 04-008

Priority 3

Infrastructure

Title: Emergency Satellite Phone System

Description of the action: This system will allow for communication between city officials during emergency incidents when primary phone lines or system is inoperable.

Lead Manager(s) Assigned: Dan Hagan, Fire Chief, Eastpointe, 586-445-5057

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.8 City of Fraser

FMP 01-022

Priority 1

Structural

Title: Mitigate basement flooding in southeast Fraser

Description of the action: In the southeast section of the City of Fraser, there is an area of houses that regularly has one to two inches of water in their basements from flooding during annual rain events. With each episode of severe rain, there are about 15 to 20 houses that report such flooding to local officials, out of about 200 homes in the at-risk area. Although there is no way to tell precisely which of the 200 homes will be the ones to experience flooding next, it *is* predictable that some of these homes will continue to be affected in this way until mitigation steps are taken. The community is a participating NFIP member.

Possible mitigation strategies include building public awareness of the need to keep water away from house foundations to discourage flooding, installation of basement sump pumps in homes. Drain improvements are currently being arranged by the city.

Lead manager assigned: Robert Vanfletern, Emergency Coordinator, Fraser, 586-293-2000

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Existing public service announcement organizations, insurance companies, home improvement loan programs.

FMP 01-023

Priority 2

Infrastructure

Title: Pump Station Improvements Project

Description of the action: The pump stations within the city need to be repaired or replaced in order to maintain an acceptable rate of discharge for floodwaters during rain events. These facilities are all outdated and between 40 and 50 years old.

Lead manager assigned: Robert Vanfletern, Emergency Coordinator, Fraser, 586-293-2000

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: City of Fraser Capital Improvements Budget, Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.9 Harrison Township

FMP 01-005

Priority 1

Structural

Title: Flood Mitigation adjacent to Clinton River Spillway

Description of the Action: Harrison Township has identified property adjacent to the Clinton River Spillway that is located within the 100-year spillway. This project would help clear the floodway of obstructions and maintain the floodplain in an open state. This will also allow the property to be used as a contiguous riverfront recreation area. The projected costs for this property is estimated at \$60,000.00. Development of property adjacent to this site is presently occurring. Purchase of property located in the floodplain will reduce the amount of water entering the Clinton Watershed, thus mitigating flood hazards for Harrison Township.

Lead Manager(s) Assigned: Anthony Forlini, Supervisor, Harrison Township, 586-466-1406

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

FMP 01-004

Priority 2

Structural

Title: Flood Mitigation of 3 Residential Units

Description of the Action: Harrison Township has identified three residential units that have had repetitive losses from flooding. It is recommended that these residential units be raised above the floodplain. The estimated values of these homes exceed \$300,000.00. The costs to elevate these homes, that are structurally sound, have been estimated at \$24,000.00. A cost/benefit analysis would justify elevating rather than the removing these residential units.

Lead Manager(s) Assigned: Anthony Forlini, Supervisor, Harrison Township, 586-466-1406

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential Sources of Financial Assistance: FMA, HMGP, CDBG, Clean Michigan Initiative, and USACE Challenge 21 Program.

FMP 01-024

Priority 3

Structural

Title: Mitigate flooding in mobile home park

Description of the action: In the northwest part of Harrison Township is a manufactured home park that experiences regular and severe problems with urban flooding. There are about 300 units in the park, and about 270 of these units are regularly affected by the flooding. It is a very flat area in which runoff waters flow from uphill, and an undersized drain that backs up, have caused as much as 2.5 to 3 feet of floodwaters to accumulate throughout the park. The community is a participating NFIP member, and the County Public Works Department is also eager to solve this problem. Although the area was designated in a lesser-risk floodplain (Zone B), county officials currently consider this the most important mitigation project in the county. (The meaning intended on the FIRM by the Zone B designation is not perfectly clear, as its description includes areas that regularly suffer flooding so long as the flood depths are less than one foot.) An engineering study for Irwin Drain improvements has been completed and the project awaits suitable funding. The map shown here was reprinted from that study. For more information on this project, please refer to the document prepared by Hubbell, Roth & Clark, Inc. for the Macomb County Public Works Commissioner. The document is entitled "Irwin Branch Drain Improvement Project: Phase 1 – Drainage Improvement Study," and was dated December 1999 (final).

The document presents and analyzes alternative strategies to reduce flooding problems in this area, including channel cleaning, an increase in existing drain capacity, replacing nearby culverts with larger capacity concrete box drains, and/or installation of a pump station/detention pond. The document recommends drain cleaning, deepening and widening, at an estimated cost of \$1,970,000.

Partners that might be involved in this project could include the Macomb County Road Commission, State of Michigan Department of Transportation, Grand Trunk Western Railroad, and the townships of Clinton, Chesterfield, Macomb, and Harrison.

Lead Manager(s) Assigned: Anthony Forlini, Supervisor, Harrison Township, 586-466-1406

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program, Michigan Department of Transportation, Community Development Block Grant Program (if mobile home residents qualify as moderate or low-income), local sources, foundations, nonprofit organizations, or corporate giving programs.

FMP 01-025

Priority 4

Structural

Title: Mitigate flooding of 350 homes east of Selfridge ANG Base.

Description of the action: In Harrison Township, all of the structures located east of the Selfridge Air National Guard Base are in a 100-year floodplain area (Zone A2). Nearly all of these houses are near canals, the Clinton River, or on the shoreline of Lake St. Clair. There are

an estimated 351 houses and 10 other buildings in the area on the north side of the Clinton River. The community is a participating NFIP member.

Possible mitigation strategies include elevation of homes, structural solutions such as flood walls or re-engineered canals to prevent flooding from storm surges or higher lake levels.

Lead Manager(s) Assigned: Anthony Forlini, Supervisor, Harrison Township, 586-466-1406

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance, U.S. Army Corps of Engineers, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners or businesses (also business associations or economic development funds) might also be useful to assist with project funding.

FMP 01-026

Priority 5

Structural

Title: Mitigate flooding of 569 structures in east Harrison south of Clinton River

Description of the action: The eastern portion of Harrison Township, south of the Clinton River, has many structures located in a 100-year floodplain (Zone A2). There are at least 569 structures in this area located east of Metropolitan Beach that are at-risk. The community is a participating NFIP member.

Possible mitigation strategies include elevation of homes, structural solutions such as flood walls or re-engineered canals to prevent flooding from storm surges or higher lake levels.

Lead Manager(s) Assigned: Anthony Forlini, Supervisor, Harrison Township, 586-466-1406

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance, U.S. Army Corps of Engineers, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-027

Priority 6

Structural

Title: Mitigate flood risks for 294 structures and homes south of Clinton River & west of Metro Beach

Description of the action: There is a portion of Harrison Township, south of the Clinton River and west of the Metropolitan Beach, that contains about 253 structures within a 100-year

floodplain area (Zone A2). About 41 additional homes also have similar flood risks (exacerbated by runoff from street and stream) although their official classification is in a Zone B area whose meaning is somewhat ambiguous.

Possible mitigation strategies include elevation of homes, structural solutions such as flood walls or re-engineered canals to prevent flooding from storm surges or higher lake levels.

Lead Manager(s) Assigned: Anthony Forlini, Supervisor, Harrison Township, 586-466-1406

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance, U.S. Army Corps of Engineers, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.10 Lenox Township

HMP 04-009

Priority 1

Infrastructure

Title: Emergency Siren Project

Description of the action: Lenox Township is still very undeveloped but is predicted to have significant development increases in the upcoming years. Installing an emergency siren system early on will ensure all areas of the community are covered before residential and commercial development begins playing a major role in land disputes for placement of these sirens.

Lead manager assigned: John Gardner, Supervisor, Lenox Township, 586-727-2085

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-028

Priority 2

Structural

Title: Mitigate basement flooding for 7 homes between Smith and 29 Mile

Description of the action: In Section 16 of Lenox Township, 7 homes are susceptible to basement flooding, between Smith Street and 29 Mile Road. The community has joined the NFIP, but has not yet had an official floodplain map created for its insurance program.

Possible mitigation strategies include building public awareness of the need to keep water away from house foundations to discourage flooding, installation of basement sump pumps in homes, dry floodproofing projects.

Lead manager assigned: John Gardner, Supervisor, Lenox Township, 586-727-2085

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, home improvement loan programs, insurance incentives. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 04-010

Priority 3

Infrastructure

Title: Additional Water Supply Line Project

Description of the action: The current infrastructure of the Township leaves itself vulnerable to water supply problems should a significant infrastructure failure occur. The major areas of concern are located in the southern 1/3 of the township area. A second supply line will provide a means of supporting the residents and businesses should a significant failure occur.

Lead manager assigned: John Gardner, Supervisor, Lenox Township, 586-727-2085

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: State Revolving Fund, Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-029

Priority 4

Infrastructure

Title: Mitigate flooding on Lowe Plank Road between 30 and 31 Mile Roads

Description of the action: Area of severe road flooding in Lenox Township on Lowe Plank Road between 30 & 31 Mile. Traffic averages about 7,500 vehicles per day, and since floodwaters reach depths of two to three feet, the road experiences times when it is not safely usable.

Lead manager assigned: John Gardner, Supervisor, Lenox Township, 586-727-2085

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.11 Macomb Township

FMP 01-030

Priority 1

Structural

Title: Mitigate flooding of four residences in Section 35

Description of the action: In Section 35 of Macomb Township, four houses in a floodplain area (Zone A7) are proposed for elevation so as to avoid future flood damages. The structures will be elevated 4 to 6 feet, once sufficient funding is obtained and applied. The community is a participating NFIP member.

Suggested mitigation strategy include land acquisition of vulnerable properties or elevating the structures above base flood elevation.

Lead manager assigned: John Brennan, Supervisor, Macomb Township, 586-992-0710

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance Program, local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners.

HMP 04-011

Priority 2

Infrastructure

Title: Trailer Park Shelter Project

Description of the action: Mobile and manufactured home construction often times lends it to be extremely vulnerable during high wind events and tornadoes. The township wishes to install 'safe rooms' in the mobile home parks to provide shelter during these events.

Lead manager assigned: John Brennan, Supervisor, Macomb Township, 586-992-0710

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-031

Priority 3

Infrastructure

Title: Mitigate flooding of North Avenue

Description of the action: Severe and recurrent road flooding along North Avenue in Macomb Township. This is the top-priority road flooding hazard in the county. North Avenue becomes impassible in some spots, and flooding extends for miles along it. Traffic counts in the south of the township are about 20,000 vehicles. In the middle of the township, traffic counts

are about 14,500 vehicles, and in the north of the township, an average of about 7,000 vehicles use the road in a normal 24-hour weekday period.

Lead manager assigned: John Brennan, Supervisor, Macomb Township, 586-992-0710

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.12 City of Mount Clemens

FMP 01-033

Priority 1

Infrastructure

Title: Clinton River Project

Description of the action: In order to maintain proper flow in the river, the city wishes to dredge certain areas that have become blocked with debris. A second action includes repairing earth walls along the riverbanks to ensure stabilization and help prevent floodwaters from rising too high.

Lead manager assigned: Doug Anderson, City Manager, Mount Clemens, 586-469-6818

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 04-012

Priority 2

Infrastructure

Title: Trailer Park Shelter Project

Description of the action: Mobile and manufactured home construction often times lends it to be extremely vulnerable during high wind events and tornadoes. The city wishes to install 'safe rooms' in the mobile home parks to provide shelter during these events.

Lead manager assigned: Doug Anderson, City Manager, Mount Clemens, 586-469-6818

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-032

Priority 3

Infrastructure

Title: Mitigate flooding on northbound Gratiot

Description of the action: Flooding on northbound Gratiot within the city limits of Mount Clemens. The flood-prone area of the road averages traffic of about 17,300 vehicles per day but merely causes temporary delays to the traffic.

Lead manager assigned: Doug Anderson, City Manager, Mount Clemens, 586-469-6818

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.13 City of New Baltimore

FMP 04-020

Priority 1

Infrastructure

Title: Improve Drainage throughout Northridge Subdivision

Description of the action: Three options, ranging from 70,000 to 300,000 dollars in cost, have been identified. The options are:

1. Replace the 48 inch culvert at Northridge with an 85 x 54 inch pipe. This would solve the local problem by transferring it downstream.
2. Lower the culverts at Maple Creek and residential drives at #54123 and #54151 and reditch 2,400 feet.
3. Replace all culverts and re-ditch from 25 Mile Road to Crapeau Creek.

Lead manager assigned: John T. Monte, P.E., (810) 794-1931, Ext 222

Schedule to initiate action: Apply for 2005 Pre-Disaster Mitigation Grant to address problem

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: State Revolving Fund, Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 04-021

Priority 2

Infrastructure

Title: Upgrade Harbor Creek Storm Station pumps

Description of the action: Replace existing 7.5 hp pumps with 40 hp pumps and update controls at an estimated cost of \$200K. The Harbor Creek Storm Station, a storm flow lift station, is currently undersized to handle maximum storm flows with the potential for flooding to result.

Lead manager assigned: John T. Monte, P.E., (810) 794-1931, Ext 222

Schedule to initiate action: Apply for 2005 Pre-Disaster Mitigation Grant to address problem

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: State Revolving Fund, Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 05-001

Priority 3

Infrastructure

Title: Upgrade Orchard Lake Emergency Overflow

Description of the Action: Replace existing 12-inch emergency overflow with a 30-inch overflow at an estimated cost \$58K. The existing emergency overflow is currently undersized to handle emergency situations with the potential for flooding to result.

Lead manager assigned: John T. Monte, P.E., (810) 794-1931, Ext 222

Schedule to initiate action: Apply for 2005 Pre-Disaster Mitigation Grant to address problem

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: State Revolving Fund, Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-034

Priority 4

Structural

Title: Mitigate flooding of 17 homes along Base Street southeast of Front Street

Description of the action: In the city of New Baltimore, there is a shoreline area which experiences regular flooding. In this area, Base Street (in the area southeast of Front Street) has about 17 houses which are in the 100-year floodplain (Zone A3). The street is only 10 feet wide and access to the houses is extremely difficult in cases of flooding or emergency. Two of the houses in the area are identified as repetitive-loss structures by the NFIP, in which this community is a participating member. Sandbagging activities have been observed to try to protect other floodplain houses on this street from damages.

Possible mitigation strategies include acquisition or elevation of the repetitive-loss property. Replace emergency sandbagging efforts with some sort of flood wall.

Lead manager assigned: John T. Monte, P.E., (810) 794-1931, Ext 222

Schedule to initiate action: Apply for 2005 Pre-Disaster Mitigation Grant to address problem

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, re-engineering options possibly researchable by the U.S. Army Corps of Engineers. Local sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

FMP 01-035

Priority 5

Structural

Title: Flood mitigation of home at far eastern edge of New Baltimore

Description of the action: On the far eastern edge of New Baltimore is a house that has been identified as an NFIP repetitive-loss structure, located in a 100-year floodplain (Zone A3). It no longer appears on the current list, but because of its known damages, it has been scheduled for elevation once this plan is approved and adopted. The community is a participating NFIP member.

Suggested mitigation strategies include elevation or acquisition of structure.

Lead manager assigned: John T. Monte, P.E., (810) 794-1931, Ext 222

Schedule to initiate action: Apply for 2005 Pre-Disaster Mitigation Grant to address problem

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program. Local funding sources, foundations, nonprofit organizations, corporate giving programs, or the homeowner(s) might provide additional funds necessary for the proposed solution.

FMP 01-036

Priority 6

Structural

Title: Flood mitigation of 18 homes south of Base Street and west of Front Street

Description of the action: In New Baltimore, a participant in the NFIP, there are about 18 houses to the south of Base Street and west of Front Street that are located in 100-year floodplain areas (Zone A3) next to the shoreline or canals. The houses are not all in the same area, but are located around 6 different streets. The community is a participating NFIP member.

Possible mitigation strategies include elevation of homes, structural solutions such as flood walls or re-engineered canals to prevent flooding from storm surges or higher lake levels.

Lead manager assigned: John T. Monte, P.E., (810) 794-1931, Ext 222

Schedule to initiate action: Apply for 2005 Pre-Disaster Mitigation Grant to address problem

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance, U.S. Army Corps of Engineers, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.14 Village of New Haven

FMP 01-037

Priority 1

Structural

Title: Flood Mitigation of 10 Homes near Shook Drain, Haven Ridge Road, & Clark Street

Description of the action: The City of New Haven has about 10 houses that are located in a 100-year floodplain (Zone A6) and therefore are at risk for flooding damages. They are located in an area near the Shook Drain, Haven Ridge Road, and Clark Street. The city is a participating NFIP member.

Possible mitigation strategies include elevation of structures. Perhaps drain cleaning or widening or the creation of berms could help prevent flooding.

Lead manager assigned: Ken Simms, Sr., President, New Haven, 586-749-5301

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program, U.S. Army Corps of Engineers, existing county drain maintenance/improvement funds. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 04-013

Priority 2

Infrastructure

Title: Back-up Generator Project

Description of the action: The Village of New Haven has many key facilities located within its borders. The installation of backup generators will allow the city to perform its essential functions during loss of power events.

Lead manager assigned: Ken Simms, Sr., President, New Haven, 586-749-5301

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.15 Ray Township

FMP 01-038

Priority 1

Structural

Title: Mitigate flooding of 9 Structures at North Avenue and 29 Mile Road

Description of the action: An area in Ray Township at North Avenue and 29 Mile Road experiences flooding. There are 9 structures there that, in terms of their risks and the regularity of flooding, should currently be considered to be in a floodplain area. In the worst case, in February 2001, one of the houses had 6 to 7 inches of water in it. The community has joined the NFIP but not yet had its floodplain areas officially mapped for that program.

Possible mitigation strategies include drain cleaning which is apparently needed to the east of this area to discourage overflow onto the relatively flat lands nearby. Such drain cleaning throughout the township could alleviate many of its flood problems. Use of berms or flood walls in key locations could protect structures until such cleaning occurs, or if upstream developmental effects render such cleaning insufficient. Improvements to the drainage system on and along North Avenue might also be appropriate.

Lead manager assigned: Charles Bohm, Supervisor, Ray Township, 586-749-5171

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Michigan Department of Agriculture Inter-County Drain Program or existing county drain maintenance funds. Local funding sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-039

Priority 2

Structural

Title: Flood Mitigation of 4 homes at North Avenue north of 26 Mile Road

Description of the action: An area in Ray Township on North Avenue just north of 26 Mile Road was flooded, with 18 inches of water in the basement of a house when the East Branch of the Coon Creek backflowed into it in 2001. (It is an older house with no backflow preventer.) There are three houses to the southwest of this flooded one that should also be considered in at least a 100-year floodplain. The community has joined the NFIP but not yet had its floodplain areas officially mapped for that program.

Possible mitigation strategies include the installation of backflow preventer in home, structural flood protection or channel improvement project for the Coon Creek.

Lead manager assigned: Charles Bohm, Supervisor, Ray Township, 586-749-5171

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Michigan Department of Agriculture Intercounty Drain Program or existing county drain maintenance funds. Local funding sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-040

Priority 3

Infrastructure

Title: Mitigate flooding of 26 Mile Road

Description of the action: Ray Township road flooding on 26 Mile Road which can cause the road to close for several days, rendering it unusable to the average of 12,000 vehicles per day that otherwise would be there. In addition, aerial rescue was needed for motorists whose cars were stuck in the water.

Lead manager assigned: Charles Bohm, Supervisor, Ray Township, 586-749-5171

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-041

Priority 4

Infrastructure

Title: Mitigate flooding of North Avenue north of 29 Mile Road

Description of the action: Ray Township road flooding on North Avenue north of 29 Mile Road, threatening nearby structures and affecting an average of 8,000 vehicles per day that would use the road.

Lead manager assigned: Charles Bohm, Supervisor, Ray Township, 586-749-5171

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

FMP 01-042

Priority 5

Infrastructure

Title: Mitigate flooding of 31 Mile Road

Description of the action: Ray Township road flooding on 31 Mile Road over a length of about 2 miles. Although little-traveled (averaging only about 200 vehicles per day), the road has sometimes been completely shut down by this flooding

Lead manager assigned: Charles Bohm, Supervisor, Ray Township, 586-749-5171

Schedule to Initiate Action: Initiate Flood Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.16 City of Richmond

HMP 05-006

Priority 1

Infrastructure

Title: Trailer Park Shelter

Description of the action: Mobile and manufactured home construction often times lends it to be extremely vulnerable during high wind events and tornadoes. The township wishes to install 'safe rooms' in the mobile home parks to provide shelter during these events.

Lead manager assigned: John Moore, Emergency Management Coordinator, City of Richmond, 586-727-7571

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 05-007

Priority 2

Life Safety

Title: Establish Ordinance to locate all Future Power Lines Underground

Description of the Action: Power outages are a recurring theme associated with damage to aboveground power lines during severe winds, thunderstorms, snow and ice storms, and other severe weather incidents. This action is to have the municipal government pass an ordinance to require all new installations of power lines and electrical services to be placed below ground.

Lead manager assigned: John Moore, Emergency Management Coordinator, City of Richmond, 586-727-7571

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.17 Richmond Township

HMP 04-014

Priority 1

Infrastructure

Title: Emergency Siren Project

Description of the action: Install an emergency siren system. Richmond Township is still very undeveloped but is predicted to have significant development increases in the future if the urban sprawl trend continues. Installing an emergency siren system early on will ensure all areas of the community are covered before residential and commercial development begins playing a major role in land disputes for placement of these sirens.

Lead manager assigned: Gorden Fuerstenau, Supervisor, Richmond Township, (586) 727-8998

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 05-008

Priority 2

Life Safety

Title: Establish Ordinance to locate all Future Power Lines Underground

Description of the Action: Power outages are a recurring theme associated with damage to aboveground power lines during severe winds, thunderstorms, snow and ice storms, and other severe weather incidents. This action is to have the municipal government pass an ordinance to require all new installations of power lines and electrical services to be placed below ground.

Lead manager assigned: Gorden Fuerstenau, Supervisor, Richmond Township, (586) 727-8998

Schedule to Initiate Action: Initiate Hazard Mitigation Assistant Grant Program application by July 1 of each year and resubmit, if necessary, following every Presidential Disaster Declaration with the State of Michigan. Completion of acquisition of property should be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division, Corps of Engineers, FEMA

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.18 Village of Romeo

HMP 04-004

Priority 1

Life Safety

Title: Establish Hazardous Materials Response Team

Description of the Action: Establish a Hazardous Materials Response Team for north and central Macomb County.

Lead Manager(s) Assigned: Macomb County Office of Emergency Management, Pete Locke, (586) 469-5270 with assistance from the Shelby Township Fire Department, Thomas Means, (586) 731-3476.

Schedule to Initiate Action: Initiate grant applications by May 1 of each year, and resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project should be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: Michigan State Police Emergency Management Division.

Potential Sources of Financial Assistance: Hazard Mitigation Grant Program, State Hazard Mitigation Program.

HMP 05-009

Priority 2

Life Safety

Title: Establish Ordinance to locate all Future Power Lines Underground

Description of the Action: Power outages are a recurring theme associated with damage to aboveground power lines during severe winds, thunderstorms, snow and ice storms, and other severe weather incidents. This action is to have the municipal government pass an ordinance to require all new installations of power lines and electrical services to be placed below ground.

Lead manager assigned: James Vanderlinden, Police Chief, Village of Romeo, (586) 752-3587

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

4.4.19 City of Roseville

HMP 04-017

Priority 1

Infrastructure

Title: Warning Siren Project

Description of the action: Install warning siren system. The City of Roseville currently uses cable TV system for severe storm warnings. Installation of warning sirens will improve the alert time to notify residents of severe weather.

Lead manager assigned: Steve Truman, City Manager, Roseville, 586-445-5440

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

HMP 04-015

Priority 2

Infrastructure

Title: Back-up Hydrant Project

Description of the action: Install a back-up water main and dry hydrant system in the island along Gratiot Avenue to be used in the event of an infrastructure failure or power loss. System is planned to be supplied and pumped from the Marsack gravel pit located at Gratiot and 14 Mile Roads.

Lead manager assigned: Steve Truman, City Manager, Roseville, 586-445-5440

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

HMP 04-016

Priority 3

Infrastructure

Title: Back-up Generator Project

Description of the action: The City of Roseville has many key facilities located within its borders. The installation of backup generators will allow the city to perform its essential functions during loss of power events. The generator will also help to supply power to pump water from the proposed back up water supply system.

Lead manager assigned: Steve Truman, City Manager, Roseville, 586-445-5440

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

FMP 01-043

Priority 4

Infrastructure

Title: Mitigate flooding on Gratiot Avenue

Description of the action: Road flooding on Gratiot Avenue north of 12 Mile Road, in Roseville. An average of 43,000 vehicles use this section of road per day, but since the flooding usually lasts for only an hour or two, the actual number of vehicles affected is about 7,000 during these events.

Lead manager assigned: Steve Truman, City Manager, Roseville, 586-445-5440

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.20 City of St. Clair Shores

FMP 01-044

Priority 1

Structural

Title: Mitigate flooding of 15 homes and 5 structures along shoreline east of Jefferson

Description of the action: In the City of St. Clair Shores, there are shoreline areas to the east of Jefferson Avenue that have numerous structures at risk from flooding—mainly when there are storm surges on Lake St. Clair or when lake levels are high. Thirteen of these houses had been proposed for elevation projects using the Hazard Mitigation Grant Program, but the project fell through. The houses are located in the 100-year floodplain (Zone A2). The base flood elevation at the lake front is about 582.5 feet, and many of these houses proposed for elevation have their first floors several feet below that mark. One of these houses has its first floor located nearly five feet below the base flood elevation. Some of the houses also have basements, which would probably flood completely, such as one that also has its first floor 3.7 feet below the base flood elevation. There are five structures currently on the NFIP's repetitive-loss list that are located in the shoreline areas of this city. Every 2 to 3 years on average, flooding causes about \$15,000 damage to each of at least 5 homes in the area, with damage estimates of twice that amount in a 10-year event. The city is a participating member of the National Flood Insurance Program.

Possible mitigation strategies include elevation or acquisition of structures that are below the base flood elevation. A structural solution such as a flood wall might be a cost-effective way to prevent shoreline and storm surge flooding.

Lead manager assigned: Kenneth Podolski, City Manager, St Clair Shores, 586-445-5200

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: The proposed HMGP elevation projects might be revived if greater amounts of matching funds can be found from local sources, foundations, nonprofit organizations, or corporate giving programs. (Local homeowners were reportedly reluctant to have elevations proceed without reassurance that a means could also be found to finance related landscape, garage, and driveway alterations to accompany such projects.) The U.S. Army Corps of Engineers might be involved in a shoreline structural solution. The Flood Mitigation Assistance Program could be used for elevations or acquisition of specific houses that are at-risk. Local funding sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-045

Priority 2

Structural

Title: Flood mitigation of 150 houses east of Jefferson around Statler Street

Description of the action: In the City of St. Clair Shores, there are numerous structures located in floodplain areas (Zone B), whose risks can be exacerbated by wave action from the lake. There are an estimated 150 houses of this type in the area east of Jefferson around Statler Street (and several streets to its south). Other areas of the city may have similar problems (between 10 Mile Road and 13 Mile Road, east of Jefferson), but these houses

around Statler have been identified by local officials as slightly higher priority due to their more vulnerable locations. Other at-risk shoreline areas include about 150 houses around Koerber Street south of Ardmore, and 150 structures east of Jefferson in the northern half of the city (in Zones A2 and B). The community is a participating NFIP member.

Possible mitigation strategies include elevation of homes, structural solutions such as flood walls or re-engineered canals to prevent flooding from storm surges or higher lake levels.

Lead manager assigned: Kenneth Podolski, City Manager, St Clair Shores, 586-445-5200

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance, U.S. Army Corps of Engineers, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 04-018

Priority 3

Infrastructure

Title: Back-up Generator Project

Description of the action: The City of St. Clair Shores has many key facilities located within its borders. The installation of backup generators will allow the city to perform its essential functions during loss of power events.

Lead manager assigned: Kenneth Podolski, City Manager, St Clair Shores, 586-445-5200

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program, local utilities, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might also be able to provide needed funding.

4.4.21 Shelby Township

HMP 05-010

Priority 1

Infrastructure

Title: Trailer Park Shelter

Description of the action: Mobile and manufactured home construction often times lends it to be extremely vulnerable during high wind events and tornadoes. The township wishes to install 'safe rooms' in the mobile home parks to provide shelter during these events.

Lead manager assigned: Thomas Means, Emergency Management Coordinator, (586) 731-3476

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

HMP 05-011

Priority 2

Life Safety

Title: Establish Ordinance to locate all Future Power Lines Underground

Description of the Action: Power outages are a recurring theme associated with damage to aboveground power lines during severe winds, thunderstorms, snow and ice storms, and other severe weather incidents. This action is to have the municipal government pass an ordinance to require all new installations of power lines and electrical services to be placed below ground.

Lead manager assigned: Thomas Means, Emergency Management Coordinator, (586) 731-3476

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.22 City of Sterling Heights

HMP 04-019

Priority 1

Infrastructure

Title: Back-up Generator Project

Description of the action: The city wishes to install back-up generators at the schools throughout the city. The primary use of these generators would be to supply needed power during emergency events when the schools are being used as shelters for evacuees (WMD type event).

Lead manager assigned: J Robert Johnson, Emergency Manager, Sterling Heights, (586) 446-2886

Schedule to initiate action: Initiate Hazard Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential sources of technical assistance: Macomb County, Michigan State Police Emergency Management Division

Potential sources of financial assistance: Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.23 City of Utica

FMP 01-046

Priority 1

Structural

Title: Flood mitigation of 7 duplexes and 3 homes on south side of Utica

Description of the action: On the south side of the City of Utica, there is a floodplain area (Zone A6) in which flood waters get quite deep and cause damages to 7 duplexes that are located there. These duplexes (plus 3 houses) were recently proposed for elevation projects under the Hazard Mitigation Grant Program. Estimates of 100-year flood depths have been made for these structures, and measure between 5 and 6 feet for all the duplexes! Flood depths for 10-year events have been measured at the 2 to 3 foot level. There is a senior building with three stories and parking underneath it, and flood waters affect this parking, and elevator equipment that is located on the lowest level, which significantly impedes access to and from the building. About 51 other homes and 4 buildings are also in 100-year floodplain areas around this area (including the city library), but priority must be given to these structures that are regularly being impacted by severe flood problems. The community is a participating NFIP member.

Suggested mitigation strategies include elevation of affected structures, elevation of elevator equipment in senior building, use of sump pump in parking level of senior building. Drain improvement and bank stabilization activities should also have a beneficial effect.

Lead manager assigned: Jacqueline Noonan, Mayor, Utica, (586) 731-6110

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program, local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners.

FMP 01-047

Priority 2

Infrastructure

Title: Additional Flood Mitigation Efforts

Description of the action: The city is also investigating additional measures to prevent loss from flooding. Some of these measures include using mitigation funding to dredge areas of the Clinton River which have become blocked with debris, constructing retention basins for rain events, and implementing an early warning flood system to alert all residents.

Lead manager assigned: Jacqueline Noonan, Mayor, Utica, (586) 731-6110

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Flood Mitigation Assistance Program, Hazard Mitigation Grant Program. Local sources, foundations, nonprofit organizations, corporate giving programs, or involved homeowners might also be useful to assist with project funding.

4.4.24 City of Warren

FMP 01-048

Priority 1

Structural

Title: Flood mitigation of 12 homes around Autumn Lane and Jane Court

Description of the action: The City of Warren reports that there is an area of relatively low elevation that experiences recurrent basement flooding, around Autumn Lane and Jane Court. There are about 10 or 12 houses there that have had waters of 6 to 12 inches in their basements. The area is not identified as a floodplain by the NFIP, but the community is a participating member in that program.

Possible mitigation strategies include building public awareness of the need to keep water away from house foundations to discourage flooding; installation of basement sump pumps; adjusting footing drains in houses so that current ties into sanitary sewers will no longer cause flooding.

Lead manager assigned: Lt Dennis Devooght, Emergency Manager, Warren, 586-756-2800

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Existing public service announcement organizations, insurance companies, home improvement loan programs.

4.4.25 Washington Township

FMP 01-049

Priority 1

Structural

Title: Flood mitigation of 2 homes

Description of the action: Section 15 of Washington Township has two homes, which recently suffered at least a foot of water in their basements. Since this flooding was the effect of runoff waters in that rapidly urbanizing area's particular topography, the area was not considered to be in a floodplain when the area was mapped for NFIP classification purposes. The community is a participating NFIP member.

Possible mitigation strategies include drain cleaning or improvement to expand its capacity, or other structural projects to slow or divert the flow of runoff waters; sump pump installation in basements.

Lead manager assigned: Gary Kirsh, Supervisor, Washington Township, (586) 677-4219

Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Michigan Department of Agriculture Intercounty Drain Program or existing county drain maintenance funds. Local funding sources, foundations, nonprofit organizations, involved homeowners, or corporate giving programs might provide additional funds necessary for some or all of the proposed solutions.

FMP 01-050

Priority 2

Infrastructure

Title: Mitigation of Road Flooding in Washington Township

Description of the action: Washington Township area with road flooding, major sheet flows of runoff water, and basement flooding. The road carries 2,500 vehicles per day, on average, but has not actually needed to be closed off because of this flooding.

Mitigation strategies for these areas of road flooding may include the following:

Cleaning, reconstructing, widening, or changing the type of roadside drainage infrastructure serving the road.

Improving the capacity of city sewers and associated drains that serve important roadways, including projects that separate storm sewer systems from sanitary sewer systems.

Construction of water retention basins, where possible, to allow waters to drain off roads more quickly without overwhelming local storm sewer capacity or threatening nearby properties.

Lead manager assigned: Gary Kirsh, Supervisor, Washington Township, (586) 677-4219

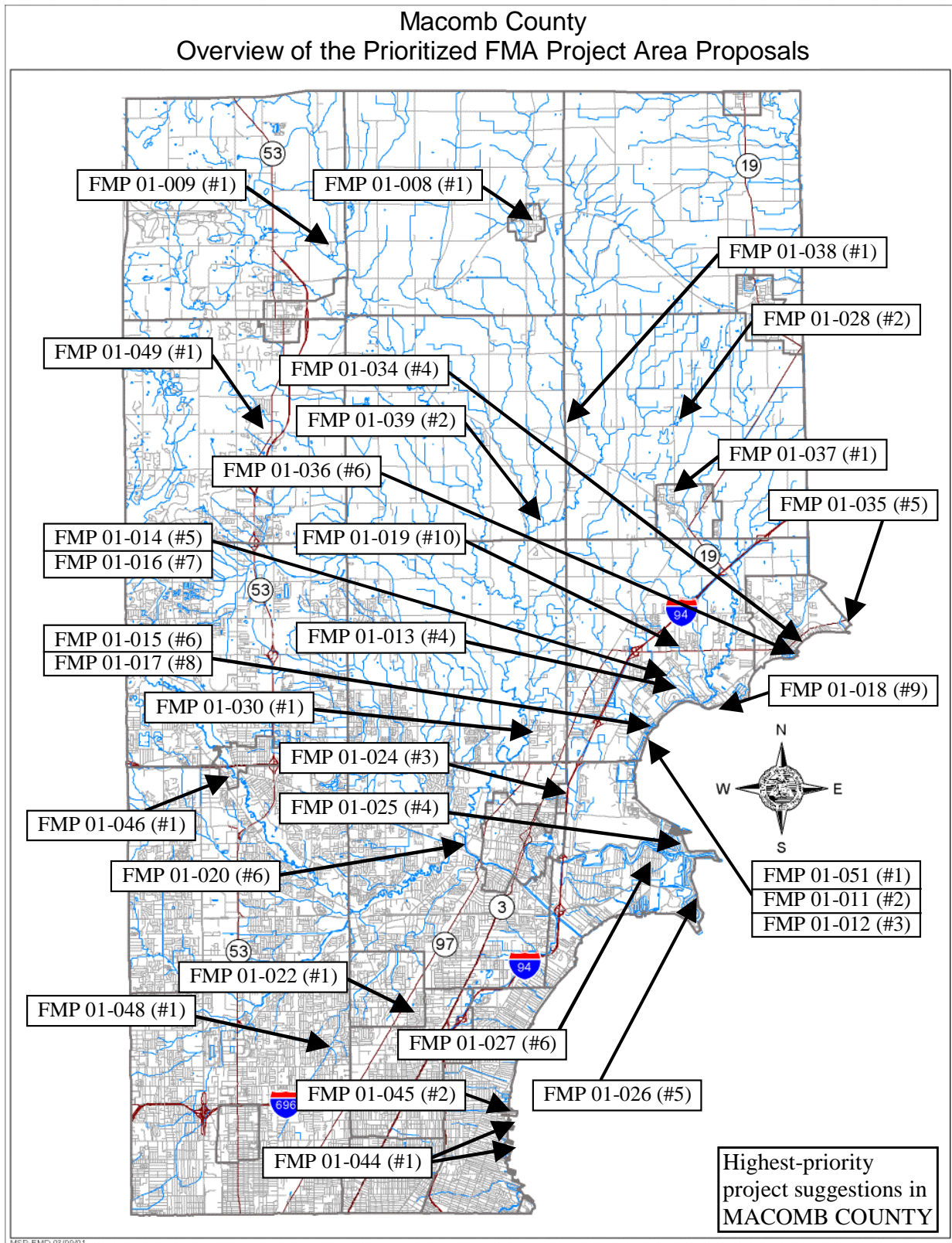
Schedule to initiate action: Initiate Flood Mitigation Program grant application by May 1 of each year. Resubmit following every Presidential Disaster Declaration with the state of Michigan. Completion of project will be accomplished within one year of receiving funding.

Potential Sources of Technical Assistance: State Hazard Mitigation Program, State NFIP Program, Michigan Stormwater-Floodplain Association, Corps of Engineers.

Potential sources of financial assistance: Hazard Mitigation Grant Program, and existing sewer and transportation programs, budgets, and allotments. Other local sources, foundations, nonprofit organizations, corporate giving programs, or involved businesses and homeowners might also be able to assist with project funding.

4.4.26 Conclusion

On the following page is a map showing the locations of all 31 of the prioritized Structural Vulnerability Flood Project area suggestions for eventual FMA consideration. Some of these projects have already been reviewed by FEMA for Flood Mitigation Assistance project grants and are ready for implementation once this mitigation plan is adopted.



Note: Local Priorities for each jurisdiction are shown in parentheses.

5 Plan Maintenance Process

Once the hazards affecting Macomb County have been identified, goals and objectives established, and an initial list of mitigation actions and projects has been developed, the critical step becomes implementation and followup.

In this chapter of the document, a minimum timeframe for updating the document was established. The procedures for reviewing the Hazard Mitigation Plan are also laid out in this section and they explain the specific steps needed to reassess the County's hazards, goals, and vulnerabilities. Also, this section provided a list of current documents and plans that the County utilizes and which the HMP will be incorporated into to ensure a smooth adoption and implementation process into normal County practices. Finally, methods of public involvement are provided at the end as a means to keep the public and the residents educated and informed when updates or changes occur.

5.1 RESPONSIBILITY FOR HAZARD MITIGATION PLAN

The Macomb County Office of Emergency Management has responsibility for developing and maintaining the Macomb County Hazard Mitigation Plan and overseeing its implementation through coordination and interaction with Macomb County departments and agencies and the community governments within and adjacent to Macomb County. Mr. Peter Locke, the Point of Contact for the Plan, can be reached at (586) 469-5270 or peter.locke@macombcountymi.gov.

5.2 PROJECT TRACKING

The list of flood and hazard mitigation projects is presented at Appendix Z as an Excel file. These projects need to be reviewed and updated semi-annually by the Local Emergency Planning Committee (LEPC). As projects are accomplished, their status will need to be updated. New projects will be identified and need to be added to the project list. This is intended to be a living document to allow projects to easily be updated, modified, added, or deleted based on Macomb County's and the Communities' needs. The Macomb County Office of Emergency Management will work closely with the LEPC and community leaders to generate support for and implement the hazard and flood mitigation projects identified.

5.3 MAINTENANCE CYCLE

Mitigation planning is an ongoing process and the Hazard Mitigation Plan needs to be reviewed, revised, and updated on a periodic basis in order to maintain pace with the County's growth and changes regarding hazard vulnerability. The Disaster Mitigation Act of 2000 requires the plan to be reviewed and updated at least once every five years for the County to remain eligible for federal funding. However, with the rapid growth of Macomb County, several levels of review and analysis will need to occur on more frequent intervals.

Each year during the last quarter of the calendar year, the Macomb County Office of Emergency Management will conduct a review of the Macomb County Hazard Mitigation Plan to determine its adequacy and completeness as discussed in the following section. If the plan needs to be updated, the Office of Emergency Management will take the steps necessary to

update the plan either in-house or by contract depending on the level of revision needed and funds availability. Pen and ink changes are acceptable but the review should be documented.

In 2009, the Office of Emergency Management will begin the process for complete revision and coordination of the plan through FEMA Region V in order to have the revised Plan approved by April 2010.

5.4 REVIEW AND EVALUATION PROCEDURES

Regular maintenance and review of the Plan, as in the case of the 5-year review, consists primarily of three main steps. These steps are taken from the "State and Local Mitigation Planning How-To Guide" (FEMA 386-4). The first step is to review the factors affecting the County's planning context. This step will help determine what changes to the Plan are warranted. The second step is to analyze the findings and determine whether to revise the planning process or the mitigation strategy. The third step is to incorporate the findings into the Plan. These steps and the specific actions associated with them are listed below in more detail.

5.4.1 Review those factors that affect your community's planning context.

Revisit the risk assessment to incorporate updated estimates of:

- ◆ Costs of Living
- ◆ Replacement Costs
- ◆ New Scientific Data on Hazard Areas
- ◆ Effect of Hazards on the Community
- ◆ Changes in Growth Patterns
- ◆ Reductions in Vulnerability due to Completion of Projects

There are many methods available for obtaining this data. The planning team should determine whether there are changes in the development patterns that could influence the effects of hazards in the community or create additional risks. Areas affected by recent disasters can provide new information in the sense that the effects of the event can be compared with what the loss analysis estimated. Updated information can be obtained from recent hydrological, watershed, traffic, demographic studies, or new mitigation techniques that are being developed. Planning may also be affected by projects scheduled to be implemented. When new information arises, often times the cost/benefit analysis needs to be revised to reflect the increasing or declining potential for losses.

Revisit capability assessment and determine changes in:

- ◆ Laws
- ◆ Authorities
- ◆ Community and State Resources
- ◆ Availability of Financial and Technical Tools

Some examples of what the County is capable of with regard to mitigation actions can be greatly affected by things like the strengthening, relaxing, or addition of land use, environmental, or other government regulations. Changes in the socioeconomic fabric of the community, such as recessions, booming economies, changes in political climate, and demographic shifts, often have repercussions on the community's sequence of mitigation priorities and the implementation of projects.

5.4.2 Analyze findings and determine whether to revise planning process or mitigation strategy

The planning team should discuss what actions should be undertaken, reconsidered, or eliminated, to further the Plan's goals. The community should be involved in reviewing the alternative mitigation actions that would result from these discussions. Some important questions to discuss with the planning team include:

Are the goals and objectives still applicable and has anything made them obsolete or irrelevant?

Review the findings of changes in the community, including changes that your mitigation initiatives have brought, to determine whether you have met your goals and if they remain consistent with current conditions. Add new goals when necessary.

Do the Plan's priorities correspond with the State's priorities?

Where applicable, make sure actions are consistent with any changes to state priorities.

Do existing actions need to be reprioritized?

Actions or projects may need to be reprioritized based on newly developed actions, changing community aspects and by learning what works and what does not work.

Are actions appropriate for available resources?

Before proceeding with actions, it is important to make sure that sufficient funding is available. Asking some of the following questions may help in researching what type of funding is available:

- ◆ Are past sources of funds still available?
- ◆ Are there new sources of funding that can be tapped?
- ◆ Are there new partnerships with nonprofit organizations or businesses that can be developed?
- ◆ What creative ways of implementing similar actions have other communities used?

5.4.3 Incorporate findings into the Plan

The planning team should then include the most recent findings about the community, the hazards and vulnerabilities, and the applicable original actions of the Plan into the revised Plan. Other areas of the Plan will need to be updated including the description of the planning process to include the steps taken to revise the Plan and how the public was involved. Additionally, the implementation strategy will need to identify who will be responsible for the new

or revised actions, the time frame, and funding sources. Finally, the revised plan will need to be reviewed by all the key stakeholders and again passed through a formal adoption process.

5.5 INCORPORATING THE PLAN INTO COMMUNITY PLANNING MECHANISMS

Macomb County currently utilizes a number of plans and documents in its comprehensive planning. One aspect of the Hazard Mitigation Plan is that it is designed to fit in with existing planning procedures and policies and work concurrently with them. The planning mechanisms that Macomb County currently utilizes includes:

- Federal Response Plan
- Michigan Emergency Management Plan
- Macomb County Emergency Action Plan
- Individual Community Emergency Action Plan (Each community within the County has an EAP)
- SARA Title III “302” Site Response Plans for facilities within Macomb County
- Macomb County Fire Mutual Aid Pact
- Macomb County Hazardous Material Mutual Aid Agreement
- Macomb County/Community Cost Recovery Ordinance

A truly effective HMP will be assimilated into the existing County planning structure without disrupting the established procedures. According to the “State and Local Mitigation Planning How-To Guide (FEMA 386-4)”, integrating the Hazard Mitigation Plan and the County’s existing plans can achieve a number of beneficial results. The primary benefit is that they both influence the location, type, and characteristics of physical growth, specifically buildings and infrastructure. The planning uses regulatory mechanisms (zoning, development ordinances, etc.) for implementing goals and objectives. Additionally, the comprehensive planning process is an established activity that is already familiar to the public, and it usually generates a great deal of interest and public participation.

5.6 CONTINUED PUBLIC PARTICIPATION

Throughout the initial Plan development, the most current version of the Plan has been made available on the County’s web site. Each publication of the Plan, every time it is revised, will be posted on the Internet. Articles will also be published in the local newspapers to notify the public of the Plan’s revision and the need for community input. At least annually, the Macomb County Office of Emergency Management will ensure that an article is published on hazard mitigation through the local newspapers to focus attention on Hazard Mitigation Planning within Macomb County. Should the need arise, a public forum or presentation will be conducted to address any questions or concerns the public may have regarding the Plan’s modification.

6 Documentation

The following section includes all the information and documents pertinent to the adoption of the plan. The final draft of the Plan was sent to both the County and the State levels. Copies were also sent to the adjacent communities of Macomb County and independent agencies, which play a major role in hazard planning. Please refer to Appendix X, which includes a copy of the invitation letter, and a list of the adjacent communities and agencies asked to review and comment on the draft Plan. Upon completion of the reviews and after receiving the comments from both parties, final changes were made to the Plan. The Plan was then sent to the Federal Emergency Management Agency (FEMA) Region V. Once FEMA approved the Plan, it was sent back to Macomb County. The County then formally adopted the Plan using the attached adoption documents. The Plan was then distributed to all the communities within Macomb County and each community formally adopted the County Plan as their own. All accompanying adoption documentation used for the County and the individual communities has been included in this section of the Plan

6.1 ADOPTION BY JURISDICTION

Jurisdiction	Adopting Authority	Date of Adoption
Macomb County		
Armada Township		
Village of Armada		
Bruce Township		
City of Centerline		
Chesterfield Township		
Clinton Township		
City of Eastpointe		
City of Fraser		
Harrison Township		
Lenox Township		
Macomb Township		
Mount Clemens, City of		
City of New Baltimore		
Village of New Haven		
Ray Township		
City of Richmond		
Richmond Township		
Village of Romeo		
City of Roseville		
Shelby Township		
City of St. Clair Shores		
City of Sterling Heights		
City of Utica		
City of Warren		
Washington Township		

7 Appendices

This appendix is intended to supplement the Hazard Mitigation Plan. The information contained in this section was gathered from a variety of sources. They included the previous 2002 Hazard Mitigation Plan, the Michigan State Police Emergency Management Division PUB 103 (Dec. 2001), numerous hazard related web sites, as well as maps and tables created from historical and Geographical Information Systems data and Macomb County resources. This information is considered the most recent and up-to-date data available.